

TÍTULO ARTÍCULO: Políticas Regionales de Innovación en Chile (2006-2013): factores relevantes para la construcción de la gobernanza del Sistema Regional de Innovación (SRI).

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“REGIONAL INNOVATION POLICIES IN CHILE (2008-2013): RELEVANT ELEMENTS FOR BUILDING UP A SYSTEMIC GOVERNANCE”.

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1. INTRODUCTION

In 2010 the Chilean government began the programme **Proyecto Red** that was designed to provide the regions institutional capacities to drive innovation activities by building up Regional Innovation Strategies. The main aim of this programme was to “contribute to decentralise the innovation system, to improve the allocation of the public investment and contribute to the development and competitiveness of the regions, creating a political and institutional sustainable solution”, focused on the inclusion and upgrade of SMEs (SUBDERE, 2010). The methodology was based on the Regional Innovation System approach used in the European RIS Programme that assured a strategic bottom up process, with the participation and consensus of SMEs, government and other relevant actors from the research area (universities and centres). This instrument aimed to allow the regions to manage their innovation systems, progressing from a centralised to a decentralised political model. The programme Proyecto Red was designed to lead a strategic planning at a regional level, providing orientation for the administrative bodies to support innovation in their regions by the adoption of the Regional Innovation Strategies.

In this particular case, the intervention is drawn in a country with a weak and fragmented systemic context that creates obstacles for the emergence of innovation throughout the territories. This systemic immaturity produces a tension between regional and national level that has negatively impacted on the regional development (OECD, 2009). As a consequence of the high degree of centralisation, there has been an emergence of regional mobilisation demanding a greater transfer of decision making powers to the Regional Government. To deal with the tensions and the requirement of the institutionalisation of a long-term regional policy, a discussion of an effective governance rises as a critical factor. The discussion develops under the assumption that an effective governance can influence on the institutional structure and orient it to innovative performance. In the case of the European regions, there is an evolution from a centralised governance to a multilevel one. Therefore, and to analyse the case of Proyecto Red in Chile, the research poses two questions, how the programme Proyecto Red contributes to build up a Multilevel Governance (MLG) that facilitates the implementation of long-term regional innovation policies? And, did the programme transferred knowledge and capacities required by the Regional Government to lead a Multilevel process?

The aims of this research will therefore be to analyse the process by which Proyecto Red has contributed to the transference of competences and capacities for innovation activities in the regions. The thesis critically studies the assumption that a multilevel governance approach give a stronger support to develop an institutional support for innovation. To achieve the research aims, the analysis is focused on three stages of the trajectory of the regional innovation policy in Chile. The first period of **regionalisation** of innovation policies in Chile, the second is the **decentralisation** and regional mobilisation, and finally the implementation of the **Proyecto Red**. In each one of them the study is directed to the resulting coordination patterns of the main actors, and the competences and capacities transferred from the national level to the Regional Governments.

2. LITERATURE REVIEW.

2.1 THE REGIONAL SYSTEM OF INNOVATION (RSI) APPROACH.

The Regional System of Innovation approach has been diffused in the European Union since 1990 and reflects the understanding of innovation as a systemic process with an emphasis on the localised production and diffusion of knowledge, in an interactive way. The attention now was focused on the regional performance and the elements that made a region more accomplished than others, breaking with the linear model used until then. With the introduction of the systemic approach researchers agreed “that knowledge, learning and innovation are key to economic development and competitiveness for firms, regions and nations” (Tödling and Trippl, 2005; p. 1203). The early studies demonstrate that the regional performance is based on the interaction among the components of the system, firms, organisations and institutions. In this perspective, the RSI is defined by “the institutional infrastructure supporting innovation within the production structure of a region” (Asheim and Gertler, 2005; p. 300), when both of these subsystems generates an interactive process, involving learning and openness to global networks there is a well-functioning RSI (Cooke et.al, 2000) (Asheim and Gertler, 2005). The interaction highlights the importance of cooperative relations among public and private actors and the institutional context to improve the innovative performance.

The use of the systemic approach in less developed countries arises the importance of upgrading and catching up processes in which is relevant to identify the link between the economic performance and the learning capability of the territory. The concept of upgrading is related to the path followed to improve the systems’ performance for innovate while catching up is the process by which a less developed country achieve the development state of industrialised ones. Both underlies the use of capabilities as a regional advantage. In this terms, capabilities are defined as “knowledge and skills embedded in individuals, organisations and institutions localised in a geographically-bounded area and conducive to innovate activity, as a result of their interactions” (Padilla, et. al,2009), that are present in different degrees and forms, depending to the context where they are developed. Saxenian (2006) is particular enthusiastic about the benefits of regional policy, arguing that Silicon Valley “demonstrates that decentralised economies can flourish...as long as local investors and entrepreneurs are able to create and recreate their regional advantage by collectively learning, innovating, and upgrading local capabilities” (Saxenian,2006; p.17). Hence capabilities are embedded in a regional system, the point is to build a system that permits the knowledge flows and the improvement of innovative activities in an interactive way, taking advantage of the physical proximity (Doloreux & Parto, 2004).

2.2 THE ROLE OF RSI POLICIES AND THE GOVERNANCE.

The decentralisation of the innovation policies are often promoted by supra structures, in opposition to the national state. In the case of Europe, the process was conducted by the European Commission and the programmes and instruments were implemented by the General Directorate of Industries and Regions over the countries’ authorities to promote aims of innovation performance and territorial cohesion for peripheral regions (European Commission, 2002). The motivation of the General Directorate was based on technical analysis

and political discussion which showed that the regional disparities were wide enough, especially in the economic sphere, for the progress towards a single market (European Commission, 2008). In terms of specific policies developed under this mandate, “the emergence of RIS signified the first step towards building soft or intangible, network-form, infrastructures in less favoured regions to complement more typical past investments in transport and energy infrastructure” (Cooke, 2002; p. 60) that appeared as a precondition for a further strategic planning and to reduce systemic failures detected.

To design and implement regional innovation policies the RSI theory was used as an *ideal type* that guides to define the required conditions and characteristics for up-grading the region onto an innovative system (Landabaso, 2003), with an instrumental perspective for policy building. Even though the theory was built over European and US experiences, researchers tend to agree that “all regions have some kind of regional innovation system, including not only regions with strong preconditions to innovation” (Doloreux & Parto, 2004; p. 10) and that the approach is beneficial to fix systemic failures.

As noted previously, RSI policies are designed to fix systemic failures, which motivates the public intervention to promote collective learning and linkages among the components. The detected failures include “organisational thinness, lock-in and fragmentation” (Fiore et.al., p. 1402) and underlies problems of a low level and dispersion of interactions among the actors. In this way, Isaksen developed a useful barriers typology for innovation (Doloreux, 2002). The organisational thinness is referred to a lack of relevant actors or a critical mass for knowledge flows, the fragmentation explained as a failure on the interaction between actors and finally, lock-in when a region or industrial sector gets captured in on an outdated technology and cannot overtake or upgrade. In order to reduce systemic failures, public policy can work by promoting public-private partnerships to assure knowledge flows and support actors to increase their absorptive capacity. This capacity is defined by the way an organisation develop learning processes that permits the use of the new knowledge to achieve results (Cooke, 2002; Padilla, 2009).

In this way, a regional innovation system should achieve some sufficient conditions in order to improve its performance. These conditions are related to these intangible or soft features defined as “the capacity for innovation, a business culture that encourages cooperation, the quality of management, a minimum level of R&D capabilities, the availability of business services, etc.” (Landabaso, 2003; p.9). In a macro perspective, this fact explains that an institutional framework which involves norms, values, and cultural, human and material resources, can promote collaboration and interactive learning influencing the behaviour of the firms and organizations. The local or regional level is in fact the best level for contacting enterprises and providing them with the necessary support for the external skills they need (Cooke, 2002; p. 62) and set instruments and incentives that drive the actors in that direction. Regional policies can play a strategic role in reducing the systemic failures and regional imbalances, especially for emergent or peripheral regions where the innovative activities have different characteristics in comparison to wealthy regions or countries.

The systemic approach proposes that public policies can contribute to shape institutional conditions towards learning and collaboration, and also the transformation from sectorial policies to a networked one (Fiore et.al, 2011, Cooke 2002). The Regional policies are developed to support the indigenous advantages by means of incentives and the diffusion of knowledge, in an interactive way “between different innovative actors that (should) have

good reasons to interact, such as between firms and universities or research institutes, or between small start-up firms and larger (customer) firms” (Doloreux & Parto, 2004; p: 8). Therefore, the role of bridging can be played by Regional Governments that have “a strategic position to encourage the setting up public -private cooperation networks”, given by the proximity to local firms and other actors that permit an influence over the innovation organisation (Landabaso, 2003, Cooke, 2002). Under this assumption the regional government should act as the leader to drive the process towards a positive interaction among the components of the system and to reduce the fragmentation by bridging relations where there is absence or thinness of them.

2.2.1 The Decentralisation of Innovation Policies in the European Union.

The decentralisation of innovation policies reveals and configures new relations among the components and actors of the system. In order to understand the tension that underlies innovation policies is relevant to differentiate the dimensions and driving forces that influence and tense the process. There are political and economic dimensions identified, as the current political discourse, the process of integration in the European Union and the economic performance. When the policies are implemented in the territory these dimensions are crossed by the logics of policy making and delivery systems. So, the implementation describes relations of top-down, bottom-up, widening and deepening of innovation policies.

In this perspective, Uyarra (2008) describes these political and economic dimensions. The first dimension is the European integration, in which the national states agreed to delegate responsibilities to the Regional Authorities. The economic dimension is related with economic performance and strategic roles to implement a single European market. Finally, the political dimension of is defined by the processes of decentralisation and devolution, carried on the European Union and that needs more attention.

In order to develop this new responsibilities it is argued that the regional governmental bodies needs a higher degree of **institutional capacity** to set up the governance, referring to the organisation and coordination of the actors. These regional governance structures emerge from a dual process of top-down institutional change, and bottom-up regional political and economic mobilisation. Keating & Loughlin (1997) differentiate between these twin processes of regionalisation and regionalism. The Regionalisation is the process by which the “state devolves democratic power downwards by the establishment of Assemblies and allocated them by hitherto centralised administrative functions” (Cooke, 2002; p: 52). On the other hand, in **Regionalism**, the regional agenda is linked to local ambitions driven by regional political movements or ‘growth coalitions’, socio-cultural factors and demands for greater autonomy (Uyarra, 2008; p. 243). In this way, regionalism is connected to mobilisation of territorial demands of greater autonomy for decision making in several aspects (Cooke, 2002). Hence, this shows that the decentralisation relies on logics of top-down and bottom-up processes, and that the leading structure needs to have certain degree of capacities and competences to drive the process.

The top-down policies refers to the general framework for innovation that constitutes a macro set-up given at the national level, such as the general budget, taxes, banks, and the instruments and incentives for universities and development agencies, as the most important (Cooke, 2002, Howells, 2004). From this viewpoint, “innovation policy links directly with

national interests and by its nature adopts a more macro, inter-regional perspective” (Howells, 2004; p: 1223), referring to the responsibility for the prioritisation and policy making that relies on the national level. In this point, the national policies pursue the maximum performance and economic growth for the national territory as a whole in contradiction to attend particular regions. So, top-down policies are general, lack of a contextual element and the flexibility needed to adapt the instruments to promote catching up of less developed regions. Top-down policies are necessary to structure the general regulations and budgets but have a negative impact in terms of promoting the interaction and knowledge flows at the territory due to a lack of proximity to the firms and other actors. This unable the national authorities to give response to local problems.

On the other hand, the bottom-up perspective is underlined by the idea that regional capabilities lie embedded within the territory and that learning processes are reproduced within a geographic area. This highlights the innovation process as part of a territorial process that occurs on a certain institutional context, embedded on social relationships where knowledge flows among the relevant actors are enabled by proximity (Doloreux and Parto, 2004). The institutional context is sustained by a community that shares common knowledge and values and the use of localised resources¹. This approach also has political implications, related with the regional mobilisation of the social movement that demands for more spaces of decision and participation, and for more resources, as well (Cooke, 2002). So, this policy of regionalisation carries a reconfiguration of institutional power, from the centre to the territories. For the OECD, conducting a “regional bottom-up diagnosis can help to find untapped regional resources for the diversification of the economy. It would also make it possible to take account of territorial spillovers among sectors and regional dynamics” (OECD, 2009; p. 23). Even though, regional decision making supports the development at a territorial level, Howells (2005) found some negative effects of this model. In this term, Regional Governments needs to adapt the top-down policies that comes from the national level, with a lower degree of innovation base, related to a less prepared system that have to compete for more resources with other regions in better conditions.

Finally, the barriers for innovation at a regional level are related with the lack of capacities and competences in different actors, but more relevant on bridging actors with the firms, such as agencies and universities, and the ones that need to drive the process. For policy making this is a relevant problem because capacities to implement innovation instruments in the public administration are allocated mainly at the national level, and in a smaller proportion in regionalised agencies. In this way, Cooke (2002) discusses the importance on the degree of autonomy that the regions requires, described as the jurisdictional competences that the regional governments effectively can use to implement innovation policies independently from the national state and the use of resources.

2.2.2 Towards an Effective Governance for Regional Innovation.

¹ Doloreux and Parto (2004; p: 11), define the resources as specialised labour market and labour force, subcontractor and supplier systems, local learning system and spillover effects, local tradition for cooperation and entrepreneurial attitude, supporting agencies and organisations, and the presence of customers and users.

The governance plays an important role in dealing with the described tensions and multiplicity of actors' interests. An effective governance can not only support policies to achieve the intended goals but also can contribute to shape the institutional framework towards a collaborative mode in a multi-layered society. Governance can organise in an appropriate manner collaboration and knowledge transfer in a vertical and horizontal way. The governance "concerns the systems and practices that governments use to set priorities and agendas, implement policies and obtain knowledge about their impacts and effectiveness" (OECD, 2011; p. 23).

For Doloreux (2002), the governance of the system and the leadership can conduct the region to shared norms and influence the creation of a cooperative disposition between the private sector, research agencies and other actors with the appropriate incentives. So, governance is an important element of the institutional framework and the organisational set-up that bring together the actors in the system in a coherent way (Borrás, 2005). Some findings of the EU policy studies shows that governance is proved to "enhance commitment and ownership of EU policies, increase the available knowledge, expertise and view-points in the strategy design and implementation, and ensure greater transparency in the decision-making process" (European Commission, 2003), as the most relevant.

A positive governance for the regional innovation system is sourced through a suitable combination of autonomy, competences and an effective degree of coordination. On one side, Cooke (2002) discusses the importance of the degree of autonomy of the regions and their competences that improves the governance of the innovation system. The devolution of jurisdictional competences in the decentralisation process gave a basic support for regional decision making in their way to address territorial problems and to relate with national and supranational levels (the European Union). Whereas Borrás (2005), describes that an effective governance should be based on elements of coordination, suitability and reflexivity. The coordination "refers to the ability of governmental action (in a general sense or in specific innovation policy actions) to transform the institutional framework in such a way that it brings together and organises coherently the interactions of the actors in the system so that innovation performance improves" (Borrás, 2005; p: 11). The concept of suitability is related to the way the government is addressing the required intervention in an appropriate form or not. Finally, the reflexivity is defined by the articulation of the innovation policy with the collective expectations.

In order to assess the concept of effective governance Borrás (2005) created categories of analysis to achieve a positive coordination:

- The existence of a strategic innovation policy.
- A positive administrative coordination of innovation policy at the middle level of executive departments.
- A rapid adaptation of the formal institutional framework in the innovation system that can adapt rapidly.
- A balanced diversity creation and market selection
- A clear distribution of roles between public and private actors
- Policy learning
- Public legitimacy and accountability

Moreover, innovation policies must be based on new forms of institutional organisation that are dynamic, horizontal and flexible and not only defined through planning objectives but also

for operative purposes, for example to implement and develop the innovation projects (Landabaso, 2003; p: 14). So, the progress on innovation policies reveal an increasing complexity of the governance architecture, “characterised by three main features; namely, they address complex problems in a strategic, holistic, long-term perspective; they set substantive output-oriented goals, and they are implemented through combinations of old and new organizational structures within the international organization in question” (Borrás & Radaelli, 2011; p. 464).

2.2.3 Capacity Building in Governmental Structures and Multilevel Governance.

Through the decentralisation process described in Europe there was an emergence of a new coordination patterns in a multilevel mode. The decentralisation of the innovation policies involved a search for new modes to coordinate not only different levels of governmental structures (Regional, National and European) but also interactions among institutions and public-private partnerships for learning processes (Uyarra, 2013). This dynamic process needed “new forms of organisation, procedures and skills, in other words new institutional capacity” (European Commission, 2003).

In order to create an effective governance, the public administration should built up basic capacities as preconditions elements. To develop this institutional capacity is relevant the underlying element of regional receptivity. The **regional receptivity**, defined “as the capability to develop policy that may assist the development of innovation and a learning economy” (Cooke; 2002; p: 65) and an adaptive capacity where the system has the ability to adjust in a positive way taking advantage of the changes (Hobson & Niemeyer, 2011). This is considered to work on the basis of a planned and evidence-based action rather than a reactive one, a decentralised and inclusive, and networked rather than individualistic. In this point of view, the more competences and capabilities are added, will result in more autonomy to strengthen the system (Cooke, 2002). But, in first place, the organisations need a skilled base of professionals to reach the requirement of a critical mass to conduct complex processes. Second, are defined the relations among the political and administrative bodies to the decision making level (Chaminade, et.al. 2008). Both are preconditions to give solution to the territory’s needs. In this perspective, strong and supportive institutions can play the role to “reduce uncertainties, coordinate the use of knowledge, mediate conflicts, and provide incentives” (Doloreux, 2002; p.247) and an active public sector is central to influence in the creation of a framework for innovation (Padilla, et.al. 2009; Doloreux, 2002).

Consequently, if the government decides to take the role of leadership to improve innovation, it should increase the public sector’s capacity in order to drive complex multidimensional problems and the coordination different actors and interests. The capacity of implementing innovation policies includes dealing with collective expectations and technical dimensions of innovative initiatives. In this case, the governmental structure can act linking the actors with the appropriate evidence and technical alternatives “to develop actions plans based on horizontal, strategic approaches and translate these into concrete measures” (OECD, 2005). In this terms, both dimensions need a multidisciplinary perspective since this knowledge is allocated in different governmental levels, agencies and actors, particularly on development agencies, Universities and public and private research centres.

The coordination of different jurisdictional levels and actors is considered as Multilevel Governance (MLG). This kind of governance is described as a “centrifugal process in which decision-making is spun away from member states in two directions” (Conzelman, 2008; p: 1), and as an outcome of integration and regionalisation occurred in Europe, both of which led to a diffusion of power away from the nation state. The difference with the previous governing style in this changing context, is that the government is capable to use new knowledge in terms to drive a multidimensional process (OECD, 2005). In this way, Hooge, et. al. (2001) explains that the dispersion across levels is more efficient than within the central government “to capture variety of the territories and is considered to have more potential to deal with complex multiscale problems” (E.g. Climate change, has global and local dimensions). Therefore, the multilevel governance can be defined as a means to develop the territories endogenous advantage by a new way of non-hierarchical coordination among different actors, organisations and their interests. Hence, MLG is an outcome of a higher process and a means by which various regions can get to a shared target.

Table 1: Comparing scale approaches in governance theory

Categories	Monocentric Governance	Multilevel Governance
Governing paradigm	Central authority steering society	Interactions between public and private actors, from local to global level
Scale definitions	Focus on levels at the jurisdictional scale, especially size and territorial scope of government	Focus on multiple levels at the jurisdictional and spatial scale
Why scales do matters?	The ideal scale can provide both governance capacity and citizens’ trust	Governance must operate at multiple levels in order to capture variations in the territorial reach of policy externalities
Problem definitions	Inappropriate size of governments, regional gap, overlapping jurisdictions	Inefficiency, coordination costs and lack of democratic legitimacy
Dominant responses	Structural reforms and clarification of responsibilities	Designing and implementing coordination procedures and multilevel policy arrangements

Source: Adapted from Termeer, Dewulf and Lieshout, 2010

As shown in the Table 1, the Multi-level governance requires new forms of organisation or governance style, with specific procedures and skills, in other words new institutional capacity. This becomes clear from research on the building process of regional innovation strategies. The concept of multi-level governance (Bache and Flinders, 2004) implies policy decisions and emerge out of a complex interplay of many actors across different levels, including non-state actors such as firms, non-governmental organisations, all involved in a collective process of negotiation and engagement (Uyarra, 2013; p. 155). In order to achieve coherence among the different driving forces acting at a territorial level, as described earlier, horizontal and vertical, governments require to enforce and ensure a strong base of knowledge and use it for policy purposes (Borrás, 2009).

To ensure the coherence and leadership of the process, Borrás (2009) identifies that the governance can be improved by the promotion of a learning system. This is related to the concept of absorptive capacity described by Cooke (2002) where regions compete to capture more European funds for innovation. In this case, Peripheral or less developed regions will be in disadvantage and have more difficulties in competing for funding than metropolitan areas, as they have a well prepared critical mass and prepared innovation agencies for this. In terms of self-organization Cooke discusses the importance of competences and autonomy to decide. In the case of emergent regions, "the quality of the institutional setting in some of these regions is often the main obstacle to the creation of an effective regional innovation system" (Landabaso, 2003; p.6). In this perspective, capacities are related to a lack of multidisciplinary approach to innovation and prepared agencies. Therefore, MLG requires a minimum of capacities in the governmental bodies, but the idea is not to over specialize all of them but to get to a certain balance.

3. METHODOLOGY AND RESEARCH QUESTION

3.1 Concepts and Operationalization.

The research is contextualised within the approach of Regional Systems of Innovation (RSI), which discusses the importance of territorial factors and the interaction of the components, institutions, firms and organisations, for innovative performance. This approach assumes that the production and diffusion of knowledge has a localised character and it is related with territorial capabilities. In addition, research on most developed or industrialised regions show evidence about the influence of collaboration among the actors on the transference of relevant knowledge for innovation. In this perspective, well-functioning RSI describes different coordination patterns that are influenced by the way the actors interact.

These findings drove to the implementation of regional innovation policies based on the concepts from RSI theory. In part, these were operationalised in order to use them in policy practice to reduce systemic failures and shape the actors behaviour towards collaboration for innovative performance. In the case of less developed regions the innovation system presents deeper failures than the industrialised ones centred on fragmented relations, organisational thinness and lock-in.

In order to reduce the fragmentation through the improvement of collaboration is relevant to study the relations at the regional level, what kind of forces influence their interaction and the elements that generates them. In the European case, the relations were shaped through the process conducted by the European Union (EU) to balance the development among the different regions. The most relevant processes were the regionalisation and decentralisation of the innovation policies. These processes has underlying forces that interact with a top-down and bottom-up logics, producing lack of coordination and effectiveness on the policies launched. So, the governance arises as a key factor that can organise collaboration and knowledge transfer, in an appropriate way. Furthermore, as new forms of institutional organisations can add characteristics of more dynamism, horizontality and flexibility.

The research critically analyses the assumption that the Multilevel Governance (MLG) provides a stronger support to develop long-term regional innovation policies in a changing context and with a multiplicity of actors and interests. The Multilevel Governance (MLG) is defined as the coordination of different jurisdictional levels and actors. In addition, MLG permits the government to capture regional disparities and use new knowledge in terms to drive a multidimensional process, for instance innovation policies. In order to conduct a MLG the public bodies need a certain degree of competences and capacities, which enables them to manage complex processes with multiple variables.

Methodologically, the analysis will be based on a study case of a Regional innovation Policy in Chile, the programme Proyecto Red, implemented to setup regional innovation strategies in the Chilean regions. The relevance is given by the fact that this was the first attempt of Regional Governments to conduct strategic planning on innovation. The programme in study, Proyecto Red, comprises elements of top-down, bottom-up and an emerging discussion for MLG in the field of policy making in this country.

So, the research questions are:

How the programme Proyecto Red contributes to build up a Multilevel Governance (MLG) that facilitates the implementation of long-term regional innovation policies?

Did the programme transferred knowledge and capacities required by the Regional Government to lead a Multilevel process?

3.1.1 The use of mixed methods and operationalization.

The dissertation was conducted on several stages based on the use of *Mixed Methods*, combining quantitative and qualitative approach, in order to strengthen the collection of relevant data and analysis. In addition, Mixed Methods can enhance the findings of the study case and to link micro and macro levels.

The phases of the research are described as follows.

Phase 1: Data Gathering.

The methodology used the collection and analysis of quantitative and qualitative data. The quantitative data is secondary, and is based on the use of national Innovation indicators, gathered from OECD reviews, National Commission for Innovation (CNIC) and the National Innovation Survey that conducts the Ministry of Economy every two years. Other source of quantitative data are financial reports of the national (FIC) and regional (FIC-R) innovation fund in Chile. On the other hand, the qualitative data was gathered through semi-structured interviews and documental analysis to programmes reports and relevant regional studies.

Table 2: Data Collection

METHOD	SOURCE	INFORMATION
<i>Quantitative</i>	General Statistics of production, economic activities and innovation	OECD Reviews Reports from CNIC Ministry of Economy
	National Innovation Survey 2007-2008, 2009-2010 and 2011-2012.	The Survey is conducted every two years.

		Directed to: Firms with annual sales above 2,400 UF ² Sample: Stratified Sample by size and economic sector Sample Size: 4, 614 units Sample Error: 2.5%
	Innovation Fund Financial Reports to the National Congress from 2009- 2013	National innovation Fund (FIC): By the Ministry of Economy Regional Innovation Fund (FIC-R): Undersecretary of Regional Development (SUBDERE)
<i>Qualitative</i>	Semi-structured interviews	5 Interviews to Public Officials and Advisors
	Programme Reports	Reports elaborated by the Undersecretary of Regional Development (SUBDERE)
	Regional Studies	Studies conducted by 6 Regions used to plan the Strategy: Arica y Parinacota, Tarapacá, Antofagasta, Coquimbo, Metropolitana, O'Higgins and Biobío.

The interviews were applied to Chilean Public Officials and advisors that participated in different public bodies for Proyecto Red. The interviews were semi structured and applied by Skype, due to the distance. For detailed information about the sample and the respondents go to Appendix table n° 4.

Phase 2: Operationalization of the Categories.

The conceptual categories were based on the processes of *Regionalisation*, *Decentralisation* and the implementation of *Proyecto Red*. In each phase of the study, the analysis searched for the relations configured by the regional innovation policy and the competences and capacities transferred to the Regional Government. Finally, the research identifies some limitations of the different models adopted in the policy. Through the factors of type of relations, competences and capacities allocated at the regional level, the study can explain the style of governance constructed in each stage for innovation and its outcomes. The analysis compared the three types of models proposed in the implementation of the regional innovation policy. By this means, the policy instruments and incentives shape the relations at a territorial level and the coordination patterns are associated to a certain type of governance.

The first part of the data analysis was based on an overview of the ***Regionalisation*** of the Innovation Policy promoted by the central government since the decade of the nineties. The

² UF: Inflation-indexed monetary unit that is adjusted according to the variation in the Consumer Price Index (CPI)

focus was oriented on the trajectory of the regionalisation of the innovation policies from the National to the regional level, on a *Top-Down* perspective. This perspective is defined as the general framework for innovation that constitutes a macro set-up given at the national level, such as the general budget, taxes, banks credits, and the instruments and incentives for universities and development agencies. The approach of formulating and implementing the policies led to a specific configuration of the relations among the relevant actors, defined as the policy makers and the agencies involved in delivery.

Then, the analysis was conducted on the ***Decentralisation and mobilisation*** period, marked by the regional demand for the transference of competences to the regional level. In this case, the national government created a Regional Innovation Fund (FIC-R) which was delegated to the Regional Governments for its management. During this period other kind of relations and coordination patterns emerged, characterised by a Bottom-up demand for autonomy on decision making in different fields.

In the third part, there is an in depth analysis of the programme ***Proyecto Red***, promoted by the central government and implemented by the Regional Governments launched in 2010. This programme gather top-down, bottom-up and MLG elements to coordinate its implementation.

Table 3: Conceptual Categories

Conceptual Categories	Definition	Perspective
<i>Regionalisation</i> of the Innovation Policy	General framework for innovation including the general budget, taxes, banks credits, and the instruments and incentives for universities and development agencies.	Top-Down
<i>Decentralisation</i>	Transference of competences and capacities to the Regional Government	Bottom-up
<i>Mobilisation</i>	The social demand for the transference of policy decision and resources to the regional level.	Bottom-up
<i>Proyecto Red</i>	Programme implemented to set up regional innovation policies, in coordination with national and regional public bodies.	MLG

In each category the research analyses the type of Governance or coordination patterns and the capacities and competences transferred, in order to manage a regional innovation system in a dynamic way.

- ***Governance:*** Explains the nation-society interactions. It is based on elements of coordination, suitability and reflexivity. First, the coordination gather and organises the interactions in a coherent way. Second, the suitability is related to the appropriateness of the intervention. Finally, the reflexivity articulate the policies to collective demands.

- **MLG:** Type of effective governance, which permits the coordination of different jurisdictional levels and actors, and the use of knowledge to drive a multidimensional process. Finally, MLG manage interests involved in a collective process of negotiation and engagement.
- **Transference of Competences:** Devolution of autonomy to the regions, in a Jurisdictional perspective that delimits the territory in which has authority, the functions and public action, and the attributions referred to the instruments by which the public authority can act for public administration and management.
- **Transference of Capacities:** Building and strengthening of technical and operational skills and knowledge to manage innovation policies. The direction of the transference goes from International Organisations and National governmental bodies to the regional ones.

4. ANALYSIS AND FINDINGS.

The analysis is based on a study case of the implementation of Regional innovation Policy in Chile, the programme Proyecto Red, was implemented to setup regional innovation strategies in the Chilean regions. In order to understand the way the coordination patterns and relations were configured in this last stage of the regional policies, the study observed three moments of policy making, the competences and capacities transferred and the type of governance resulted.

The periods under study, are firstly, the Regionalisation from the national agencies to the territories (top-down), secondly the Decentralisation and mobilisation, where there was a process of devolution of some competences and an emergence of regional mobilisation demanding a greater transfer of decision making powers to the Regional Government (bottom-up). A third moment is added with the implementation of the programme Proyecto Red, which is analysed in order to explain the progress to an increasing degree of complexity of relations among the different actors and jurisdictional levels. In these three moments there is a transference of competences and capacities to the Regional Government and other public bodies, required for the RSI strengthening.

The assessments applied to the regional innovation policies in Europe distinguished three key elements to build up regional capacities and new arrangements on the institutional setup. These are: (1) the presence of a skilled critical mass, (2) competence and know how, and (3) availability of financial resources (Cooke, 2002) (European Commission, 2002).

The case analysed, Proyecto Red, involved elements of multilevel governance for its implementation, which was focused on the coordination between national agencies and the regional government, and among public, academic and private actors. The programme had an impact on the dynamic of the regional system through the entry of other relevant actors (Universities) and achieved a degree of variation in terms of the regional competences. In order to understand the coordination patterns and the governance structure, the analysis is built on comparative basis between the first period of regionalisation of the national innovation system and the decentralisation model.

4.1 THE FORCES THAT SHAPE THE GOVERNANCE AT A REGIONAL LEVEL.

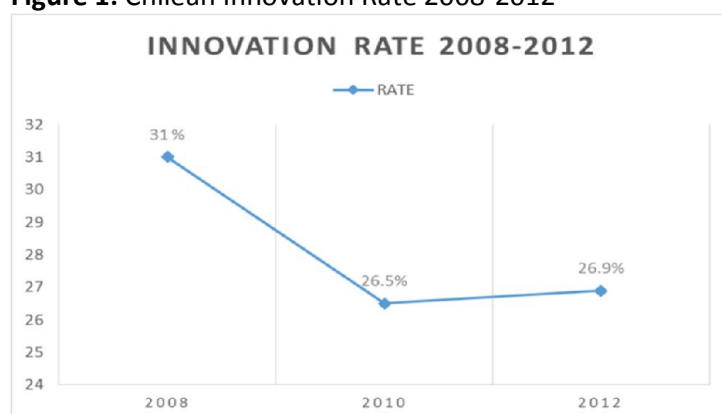
The deficiency of collaboration is a systemic failure and not relegated to firms only. The National Innovation Survey³ in 2013 shows a low rate of collaboration among firms of 10% and between firms and universities or centres of 5% and the public sector follows the same pattern. In the innovation policy field, there are two opposite forces that shapes the coordination patterns and that results in a weak governance. These are the Centralism and the regional mobilisation that seeks the decentralisation of the regional decisions.

4.1.1 The Top-down perspective: Regionalisation of the Innovation Policy.

The regionalisation process and the adoption of the model of National System of Innovation (NSI) in Chile, provoked a series of changes in the institutional set up build up to impact on the innovative performance. During the last decades a process of regionalisation was delivered in different areas of the governmental bureaucracy focused on the regionalisation of programmes and services (CNIC, 2010). Particularly, to catch up with the latest paradigm in innovation development, the Science and Technology system was reformed and reoriented to a systemic approach, starting with the implementation of the National Commission for Innovation and Competitiveness as a superstructure responsible on the design of the policy.

Once it finished a decade of economic growth in Chile in the late 1990s there has been a transition on the policies, incorporating perspectives of development, competitiveness and innovation to transform the productive structure from the exports of commodities to one of more complex products. Nevertheless, measurements in innovation shows that the efforts still are insufficient to achieve this goals, the total productivity factor dropped during this period from 2.8% to 0.4% (CNIC, 2010) and the innovation rates are stagnated around 23%, as the expenditure for the last two measured periods is 0.4% from GDP (MINECON, 2011, 2013). Even though numbers shows a slight increase, still the NSI remains immature and too dependent on the government's policies, innovation activities remain low in comparison with OECD countries. Figures shows that 24% of the firms have introduced an innovation in the last period measured, the private expenditure in R&D is 32% and only 13% of the firms that innovate cooperate among them or with other actors of the system (MINECON, 2013).

Figure 1: Chilean Innovation Rate 2008-2012

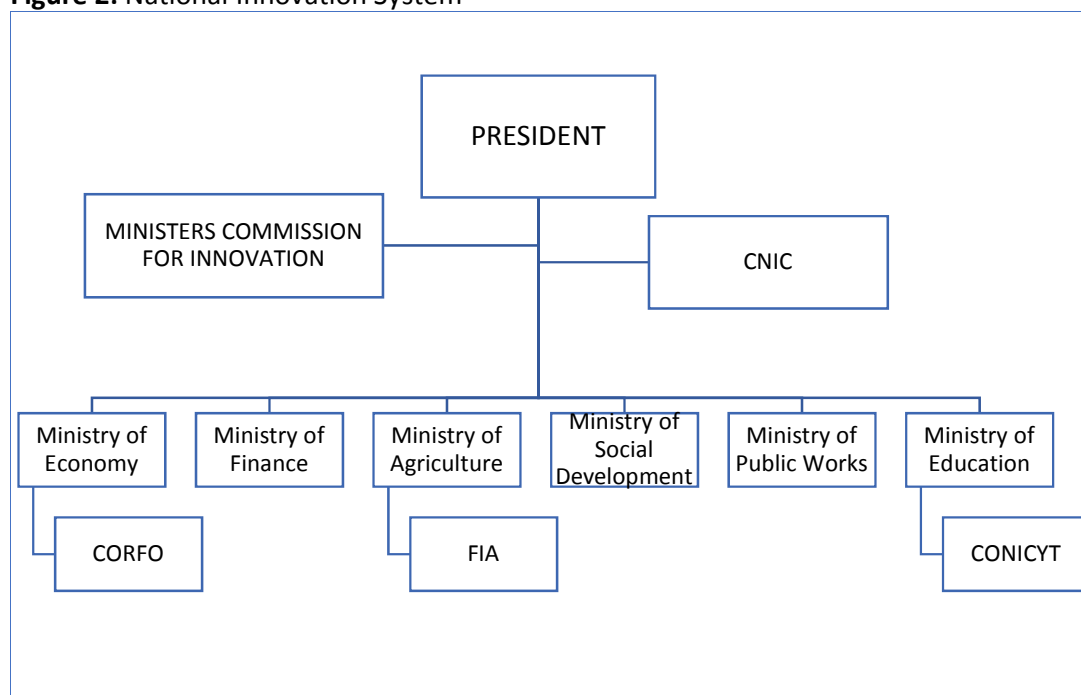


Source: National Innovation Survey 2008-2013, Ministry of Economy Chile.

³ Survey Conducted by the Ministry of Economy in Chile, every 2 years. Details on Chapter 3: Methodology.

Due to this problem, the Chilean government made adjustments introducing a systemic and strategic approach, and the political decision to participate in the current paradigm of the knowledge economy. The institutional changes implemented were, in first place, the creation of the National Council on Innovation for Competitiveness (CNIC) in 2006 and the elaboration the National Innovation Strategy which prioritised eight areas and sectors: Aquaculture, Food Industry, Mining, Special Interest Tourism, Global Services, biotechnology, Information Technology and Communications, Energy, Water Resources and Environment. Secondly, and in order to provide financial resources, was implemented the Innovation Fund for Competitiveness (FIC), allocated in an 85% through instruments of the Science Commission CONICYT and the Economic Development Agency CORFO, and an indirect participation of Universities and other research centres. A proportion of this Fund (FIC) was transferred annually to the regions for their administration, conditioned to the national framework provided by the Ministry of Economy. Third, CORFO implemented cluster policies in the territories to respond to the prioritised sectors in the National Strategy. But, even though the clusters were allocated in different regions, CORFO managed the programmes in a centralised way. So, by the end of the implementation of the national innovation strategy, the institutional setup had changed radically.

Figure 2: National Innovation System



Source: Adapted from CNIC, 2010

In this period of regionalisation, the programme implemented by CORFO, was the creation of the Regional Development Agencies (RDAs). The main aims of the RDAs' were to support entrepreneurship and innovation through the setting of strategies or midterm agendas and the selection of territorial clusters in collaboration with the private sector. In this way, setting agendas "opens the way to place-based analysis in order to find untapped regional resources and thus diversify the economy" (OECD, 2009; p: 23). In addition, they promoted the

participation of SMEs in innovation through Private/Public Strategy Boards (OECD, 2009) (Moguillansky, 2010). After their implementation, OECD (2009) advised some measures to guarantee effectiveness, such as strengthening the RDAs' Board, increasing the number of professionals with analytical capacities over regional vocations and opportunities, and a proper link between the agenda and financial resources.

On the other hand, CONICYT launched the programme of Regional Scientific and Technological Centres, with the support of SUBDERE and the Regional Governments. The aim was to distribute with a decentralised criteria resources for R&D and capacities from a territorial perspective. The model to manage the centres was based on the collaboration between these three actors and the Universities that applied to a tender with a specific project (Interview Advisor 2, 2014). In this case, the relations among the actors is clearly setup and characterised by its horizontality. Basically, each agent provides different resources for the implementation of the Centre. CONICYT plays a role of technical and administrative unit, SUBDERE is the political articulator that promotes the territorial policies in the public administration, and finally, the Regional Government that interprets the regional interests and delivers financial resources to support the Centre (Interview Advisor 2, 2014). In this way, the coordination patterns are conditioned by horizontality, negotiation and collaboration among the actors. Even though the implementation has some effectiveness, needs a higher financial provision and to extend them "in areas with enormous potential, such as alternative energy sources or biotechnology" (OECD, 2009; p. 22).

The third institutional change was the creation of the Foundation for Agrarian Innovation (FIA). This public agency is focused on the promotion of innovation in agriculture and livestock sector through financial and technology transfer instruments. This is a centralised agency dependent on the Ministry of Agriculture which runs a series of territorial programmes to build up Agendas for Innovation in Agriculture for the 15 regions that ended on 2010.

4.1.2 Transference of competences and limitations of the Regionalisation.

This regionalisation period is characterised by the installation of innovation policies with a top-down perspective. The national agencies focus on the territorial strategic planning, working from the national level directly with regional firms and universities or research centres. This is observed in the attempts to regionalise through different planning instruments in this period, such as RDAs', Regional Centres and the agriculture agenda. This produces an over intervention of the public bodies, and a low contribution to create critical mass or institutional thickness.

The regionalisation of the National System of Innovation (NSI), as a top-down model, clearly presents limitations to achieve territorial needs and diversity. The regional actors criticised the way the National Agencies delivered innovation policies with a top-down perspective that was unable to capture the variety and opportunities of the territories that differs from the peripheral or less developed regions to the metropolitan ones. An external assessment commissioned by the CNIC advised about the disconnection of the cluster policy and the regions, so proposed that "a key element will be to anchor the clusters promoted by CNIC in regional institutions, including applied institutes physically collocated with the spatial concentration of the clusters" (CNIC, 2010; p. 22). In the same direction, OECD stressed the relevance of flexibility and adaptability of the instruments, and the coherence between the

regional agendas with the national priorities (OECD, 2009). Nevertheless, in opposition to these recommendations the agencies insisted on the national system of innovation approach.

These problems led to the discussion about the development of innovation policies with a regional perspective and the ideal type of governance to support this kind of processes. The critique is focused on the fact that national and regional policies were driven on parallel terms and there was no synergic relation among them (DIPRES, 2011; Interview Official 2, 2014). So, the proposals of political actors included the establishment of a general framework that included coordination patterns and participation of the Regional Government and Public Agencies, firms, universities and organised civil society⁴ (UFRO, 2009). In other words, the actors demanded the recognition of the Regional Governments' leadership in the innovation policies field.

In terms of competences and outcomes of this period, the most important milestone of the regionalisation was the creation of the Innovation Fund (FIC-R), which permitted the regional government to negotiate, up to certain extent, the implementation of innovation instruments. In the practice the Regional Government had the competence to distribute the fund but not to allocate the resources within a strategic view. (Interview Advisor 2, 2014). Unfortunately, the creation of the fund was not accompanied by a robust training programme for the professionals to allocate financial resources into coherent instruments. In this way, during the first years (2008-2010) the funds were transferred mainly to national agencies for their normal programmes and the professionals learned in practice administrative procedures (DIPRES, 2011).

During the years 2008 and 2010 the Regional Government concentrated the efforts on the effective expenditure by means of financial assignments to the agencies but there was no technical capacities to evaluate the initiatives. So, the activities focused on financial reports and the proper and accountable use of resources (DIPRES, 2011).

In terms of capacity building, there was an emergence of a slight degree of institutional experience as an outcome of the strategic planning initiatives. This is observed in the regions of Valparaíso, Biobío and Los Ríos, given by the experience of the RDAs' and the Regional Centres (Interview Official 1; Advisor 1 and 2, 2014). Basically, these experiences installed a systematic process of interaction among SMEs and public bodies in the innovation field.

Other result of the programmes delivered was the slow transition to a systemic approach, considering the SMEs requirements to innovate, as well as the context where they developed and the barriers, including human capital, financial, regulations and infrastructure (Interview Advisor 2; Official, 1, 2014).

In this way, the regionalisation contributed with a degree of institutional learning. The strategic planning and the administration of the fund resulted in the transference of capacities and competences to the regional government.

⁴ Organised civil society is defined as Foundations and Non-Governmental Organisations (NGOs).

4.2 The Process of Decentralisation of Innovation Policies.

The decentralisation process is motivated by a process of mobilisation, defined by a political demand of the regions for more autonomy for policy decision making and the expenditure of their resources. Political and academic actors criticize the excessive centralization of incentives and capacities in Santiago, while natural resources are distributed throughout the country's territory (UFRO, 2009). Hence, the centralised system has benefited the capital city over the development of the rest of the regions that led onto territorial inequality in different dimensions, such as poverty, education and productivity (OECD, 2009), as stated "economic power and research resources concentrate in Santiago, and tend therefore to be disconnected from the growth sectors of the economy" (CNIC, 2010; p.22).

In this perspective, regional actors requested their inclusion to the discussion to prioritise the regional innovation policies. Hence, there is an explicit consensus for the need to open dialogue spaces between national and regional level to exchange information, knowledge and to settle shared and long-term policies that responded to their problems (Interview Official 3, 2014). So, the demand is centred on the devolution of autonomy to manage their innovation systems in order to strengthen weak points such as the presence of skilled professionals, the design, implementation and adjustment of incentives (UFRO, 2009). And, in addition to reinforce the formal bodies, to build up capacities for innovation that permits the enhancement of informal relations through networks and collaboration, which is diagnosed as a weakness of the system (Regional Studies, 2011).

But the pressure for a deeper decentralisation in Chile, comes also from international organisations such as OECD and the Inter-American Development Bank (IDB). The OECD advised about the role of the central government and its relation with the territories in this matter, and encouraged them to support the regional authorities to "understand and react to global challenges, and providing innovative solutions to help them gradually integrate new approaches into their economic development programmes" (OECD, 2009; p. 22). In this way, the international organisms influenced on the renewal of institutional arrangements in this direction.

4.2.1 The relations configured by the administration of the fund FIC-R.

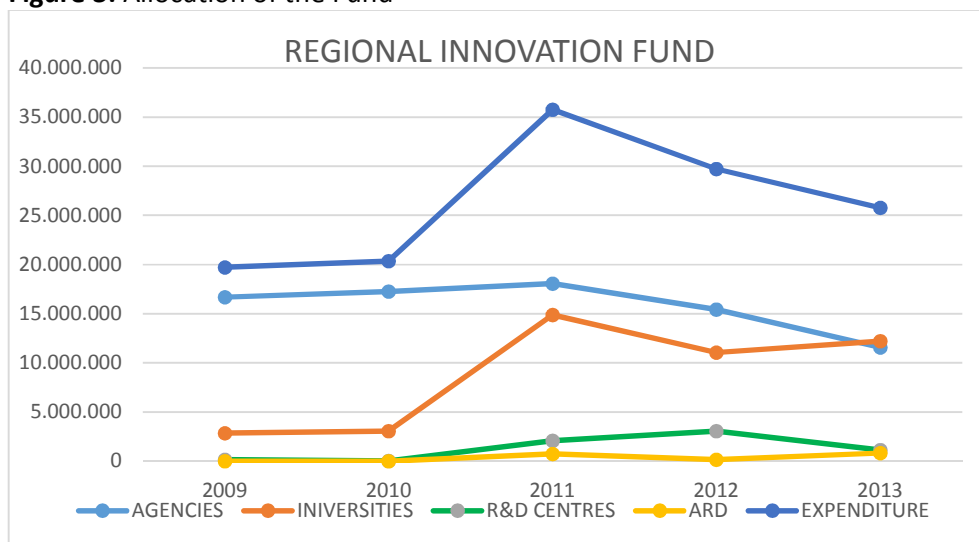
The relations among regional and national actors is crossed by the competences to administer the fund FIC-R. The framework of the fund is a mix between a regional distribution and a centralised implementation. So, the Regional Government decide the proportion of the transference of the resources to National Agencies to a standardised list of instruments (DIPRES, 2011). This framework and the lack of capacities in the professionals left no autonomy to the regional authority to decide coherent incentives to their regional conditions and opportunities, and to design pertinent instruments.

Nevertheless, the vertical relations between the national and regional level started to change slowly. The first step was the demand of the regional professionals to establish a *coordination roundtable* with the Ministry of Economy, in order to solve administrative problems on the operation of the fund. The increasing complexity and numbers of projects that raised up from

165 projects financed in 2009 to 327 in 2013, (SUBDERE, 2009-2013) provoked administrative problems (Interview Official 3, 2014). Therefore, the aim of this space was the exchange of experiences and solving problems from the practice, mainly on managerial matters and on the adaption of the innovation instruments. At the beginning the regional and national institutions that participated had a positive impression, and some results were achieved such as an improvement of the bureaucracy and financial management (Interview Official 3, 2014).

A second important change was the incorporation of the Universities for the use of the fund. Through the years the academic sector gained experience and adapted its offer to the Regional Governments' calls for tenders in a faster way than the agencies (Interview Official 3, 2014). Also, the proportion of resources oriented for Universities was released (DIPRES, 2011). The figure 4 shows the distribution of the fund between the years 2009 and 2013. In 2011 there is an increment on the participation of the Universities.

Figure 3: Allocation of the Fund



Source: SUBDERE's FIC Reports 2009 to 2013

This change underlies the emergence of a negotiation capacity of the Regional Government with the Regional Universities (Interview Official 2 and 3, 2014). The relation was easier and the Universities had the competence to adapt their training, services and technological transfer to the regional needs, in comparison to the national agencies (Interview Official 3, 2014).

4.3 THE PROGRAMME PROYECTO RED AND THE EMERGENCE OF MULTILEVEL RELATIONS.

In 2010, the Undersecretary of Development (SUBDERE) launched the programme Proyecto Red, to support the implementation of Regional Innovation Strategies. The programme was part of a cooperation agreement between the Chilean government and the European Union for the period 2007-2013 that was implemented by a framework of "Innovation and Competitiveness". The innovation programme launched 11 projects with different governmental and non-governmental organisations. The objectives of this programme were

to improve the regional governance creating new and specialized governmental and non-governmental units to support the process, build a training platform for the regional bureaucracy and other officials, and enhance the participation and openness of SMEs by means of network dynamics in a regional, national and international level.

Proyecto Red was designed to provide the regions institutional capacities to drive innovation activities by building up Regional Innovation Strategies. The main aim of this programme was to “contribute to decentralise the innovation system, to improve the allocation of the public investment and contribute to the development and competitiveness of the regions, creating a political and institutional sustainable solution”, focused on the inclusion and upgrade of SMEs (SUBDERE, 2010). The methodology is based on the Regional Innovation System approach used in the European RIS Programme that assured a strategic bottom up process, with the participation and consensus of SMEs, government and other relevant actors from the research area (universities and centres). This instrument aimed to allow the regions to manage their innovation systems, progressing from a centralised to a more regionalised system.

4.3.1 The Stages of Implementation of Proyecto Red.

Proyecto Red was implemented in a similar way the RIS in European regions. It was based on four consecutive stages conditioned by the progress on organisational and consensus elements. The role of the Regional Government was to drive the process characterised by linking the actors interests and viewpoints about innovation with evidence and technical alternatives for concrete action.

In order to progress on the strategy building the Regional Government installed a multilevel governance, to coordinate the different actors and create a synergic relation with them. At a regional level, the coordination patterns were based on a governance architecture defined by an institutional agreement between the public, private and academic sector, to solve the barriers for innovative activities in SMEs in the territorial context. The aim of this governance was to address a long-term and strategic innovation policy, related to the productive sector and to deal with collective expectations. On the other hand, the relations with the national level were supported by SUBDERE, who acted the role of intermediary between the regional government and the national agencies (Interview Official 1, 2014).

STAGE 0: ORGANISATION AND AGREEMENT

In this stage, an overarching framework is established for the leadership, collaboration and other organisational matters between the different actors that participated during the strategy building. Also it implied the political agreement and the settings of certain priorities to develop innovation within the region. The general framework of the programme was created in collaboration with the European Commission, International Agency of Chile and SUBDERE.

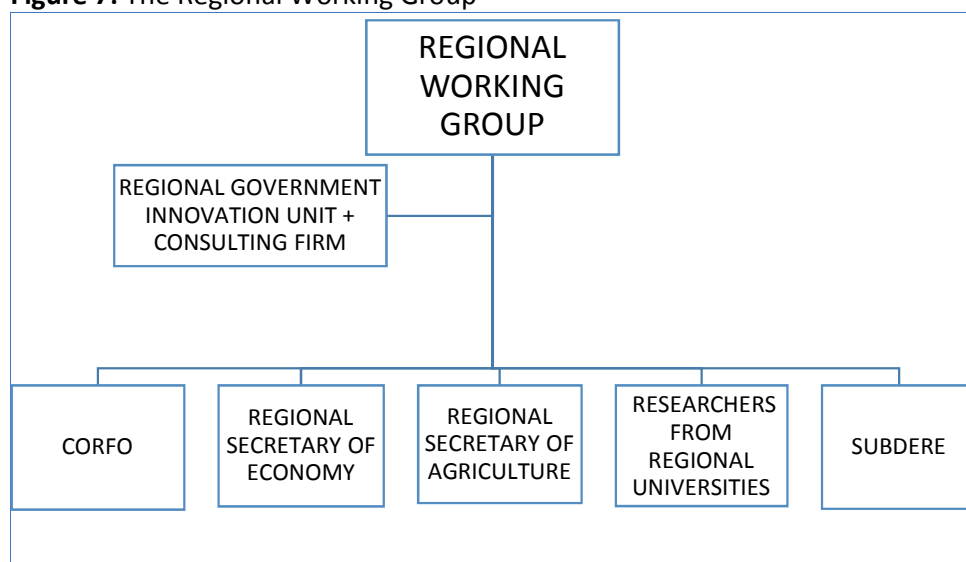
The leadership was taken by the Regional Government, and the National Level, such as the Ministry of Economy, Agriculture, CORFO and CONICYT, provided experience and evidence on the field of innovation; at a regional level participated the regional secretaries of Economy and Agriculture, in some cases the ARDs', Universities and firms representatives. This configured for the first time a complex and multidisciplinary approach towards innovation.

To support the process the Regional Government created the Innovation Unit in the Regional Government formed by professionals dedicated and trained for this. It is relevant to observe that before this initiative the Regional Government did not have specialised professionals in the area (Interview Advisor 1, 2014).

STAGE 1: REGIONAL STUDIES

For the innovation studies each region hired consulting firms with a focus on the SMEs barriers to innovate. The consulting firms worked jointly with the Innovation Unit. In order to support the process of setting of priorities based on the evidence of sectorial studies and gathering relevant information, the regional government conformed a working group consisting of professionals from CORFO, the Ministry of Economy, the Ministry of Agriculture and regional universities, mainly⁵. In this way, the different organisations provided recent information and studies from SMEs and innovation activities or barriers in the regions. The agencies provided the link with the SMEs for the data collection through interviews and roundtables (Interview Official 2 and 3, 2014).

Figure 7: The Regional Working Group



In the same way, Proyecto Red had a coordination instance at a national level, where the public agencies met to discuss the progress of the programme and to solve coordination and technical problems with the Regional Government.

The other governance structure created was the **Regional Board** that was used to give legitimacy and accountability to the process. The board was headed by the Regional Intendant and with representatives from entrepreneurs associations, Principal's from regional or national universities and Ministerial Regional Secretary of Economy, Agriculture and Treasury and CORFOs' Regional Director, among others. On the other hand, the National Board provides certain degree of sustainability and regional voice to the process. This is underlie by

⁵ Some regions incorporated professionals from tourism, education or mining, depending on the Regional economic activities and the focus of the strategy.

the absorption of the regional demands to adapt innovation incentives that follows top-down and standardised logics.

The positive influence of these governance structure is referred to the creation of new institutional arrangements. This is based on a new organisation and distribution of the roles among public and private actors to address complex problems diagnosed on a bottom-up perspective.

STAGE 2: STRATEGY BUILDING

The phase of strategy building was based on the findings of the regional studies and consensus among the actors represented in the Regional Board and the Working Group. Basically, a proposal was built between the regional government management team and the consultants hired for this purpose. This team presented the sectors selected, programmes and the pilot projects to the regional board for consensus and legitimacy.

In this stage the actors and the bodies installed interact in order to achieve collective goals on the innovation field. The coordination patterns among the different instances increase in complexity and tension due to different interests. Also, the relations and coordination patterns between the different actors become more horizontal. At the regional level the public sector begins to interact in a systematic way with firms and academic representatives to setup priorities and concrete goals. In a multilevel perspective, the national agencies establish bridges with the Regional Government to negotiate the flexibilization of the innovation instruments, in order to implement the regional strategies. During this stage the Regional Government wins in leadership to conduct the process in the territories.

STAGE 3: IMPLEMENTATION

This stage began on 2013 and has a mid-term length of four years, hence is in the middle of the process. The strategy prioritised programmes and project focused on the firm's requirement and was approved by the Regional Board. The strategy plan is being implemented by agencies and universities that can use the regional fund. In this way, there is a period of negotiation between the regional government and these actors. The financial resources for the implementation comes from FIC-R, the regional fund, and in some cases from the Regional Development Fund.

In terms of the governance, the regional and national structures tend to stop their systematic interaction and coordination activities after the strategy was approved. In this way, the Regional Government discontinued the meetings of the working group and the team was reoriented and focused to the implementation of the programmes and projects. So, it has returned to an administrative role and retracted from a participative and reflexive mode of policy making drove through the strategy building (Interview Official 1 and 3, 2014). In the case of the Regional Board occurred a similar situation and stop functioning after the approval of the strategy and the change of government in March 2014. The only Region that followed and reinforced the governance structure was Biobío who transformed the Regional Board onto a permanent and participative body called Regional Council for Innovation.

4.3.2 The training platform for Capacity building at the regional level.

The training platform was implemented and managed by SUBDERE in order to transfer capacities to the professionals that participated in the strategy building. The methodology of

the platform was based on the ERIK Network⁶ designed for the RIS programme in Europe. In the first stage of the programme, the platform delivered training courses conducted by European experts about concepts of innovation, the RSI approach and best practices on Regional Innovation Strategies, policy trends and main features to build a regional innovation strategy (SUBDERE, 2012).

The main aim of the training platform was for capacity building in a systemic perspective, particularly for public officials in order to acquire skills for the implementation of the projects and programmes of the strategy plan. The activities of the platform included Interregional meetings, open seminars, courses and visits to European regions and institutions focused on the transference of general knowledge about regional innovation policies and its management. The platform reversed a negative precondition of the programme, defined by the lack of skilled professionals to manage innovation matters. So, it generated over 150 professionals trained in all the regions to work on the topic of innovation and that did not have specific training before (Interview Official 3 and Advisor 2, 2014).

The learning platform⁷ is considered a relevant component of the programme, due to the lack of professional preparation (Interview Advisor 2, 2014). It is observed that in the implementation of the former innovation policies the programmes were implemented in a top-down logic, from the national agencies to the firms, without a systematic transference of capacities to the regional bodies. In comparison, the capacities built before Proyecto Red were based on the experience accumulation rather than through formal and oriented activities. The networking methods used by the platform improved learning capacities of the professionals and regional structures. In this way, networking permits an easier transference of tacit knowledge that is difficult to teach in formal and standardised courses. So, the regions shared know-how and solving problems methods to deal with the strategy building and its further implementation during the interregional meetings.

4.3.3 The Transference of Competences and Capacities on the public sector for innovative activities.

Through the last period it is observed a process of decentralisation of competences and building basic degree of capacities in the regional support structures for innovation. The central government has transferred functions to the regional government and promote the configuration of collaborative relations through coordination. This led to the emergence of a governance style.

In terms of the devolution of competences, from 2010 onwards the central government made a series of modifications to the regional fund for innovation, FIC-R for the public capacity building that assured an effective governance through the creation or enforcement of the support structure organisations. Some adjustments were made in terms of permanent regional competences in collaboration with the Ministry of Economy. The most important were the direct transference of the fund to the regional budget and a 5% to hire skilled professionals to manage the regional innovation policies. Prior to this year the fund was

⁶ The ERIK Network, was developed to support networking and good practice exchange between European regions. "The objectives include: benchmarking and disseminating good practices; supporting inter-regional networking on technological innovation related topics; cooperation with European regional networks to create synergies and make networking more efficient and better targeted", www.eriknetwork.net

⁷ Platform Activities are detailed in Appendix N° 4.

managed by professionals with no specific qualification or experience in innovation. In addition to the development of these components, the fund FIC-R had no restrictions to work with regional universities.

Table 4: Devolution of Competences to the Regional Government

	Before 2010	After 2010
Competences over FIC-R	The Ministry of Economy transferred the Fund to SUBDERE that, in a second phase, transferred the resources to the regions.	The Fund is added to the regional budget, directly.
	A professional administrated the fund	5% of the fund is used to hire professionals for a permanent innovation unit in the regional government.
	FIC-R Roundtable for administrative purposes	The implementation of an interregional fund used on the learning platform projects.
	The regions had to transfer over 70% of the FIC-R to National Agencies to allocate through their instruments	No restrictions to allocate the fund FIC-R

Source: SUBDERE, 2012

About institutional capacities, the European consultants involved in the programme found a low degree that reduced the potential of the regional bodies to implement innovation initiatives and interact with a multiplicity of actors and interests. For example, there was a low number of professionals' in the regional government dedicated. In addition to this, they had a low level of qualification on innovation processes and had no previous experience (SUBDERE, 2010). The only region which had institutional thickness was Biobío that had their specialised unit INNOVA Biobío⁸, which includes a public-private board and a skilled team.

The capacities needed are oriented to incentive innovative activities, knowledge transfer and setup a collaborative environment. Actually, the agency that plays this role is CORFO but the critique is that the agency is not perceived as a collaborative entity in the territory and its work is focused on the firms independent from the Regional Governments' priorities or other actors (Interview Official 1 and 3, 2014). On the contrary, CONICYT with the regional programme has become a partner for the implementation of the Strategy, and collaborates with Universities and Regional Government for other projects, as well.

In this context, the articulator of National Agencies in the regions is SUBDERE due to the existence of asymmetry of power (Interview Official 1 and 3, 2014). The Regional Governments lacks of power to raise a horizontal form of collaboration with the ministries and

⁸ INNOVA Biobío: The technological innovation fund was implemented in 2001, based on a Collaboration Agreement between the Regional Government, the Ministry of Economy and CORFO. This is the first regional instrument to co-finance innovation activities in firms.

agencies and they do not recognize its leadership on innovation matters. In this way, SUBDERE performs the function of intermediary between the agencies, mainly CORFO, and regional bodies creating a style of governance that takes some characteristics of a multilevel one.

Another relevant pattern of coordination at the regional level is an increasing interaction between Regional Government, Universities and SMEs. Universities offer services such as training, applied research projects or technology transfer in specific areas, in different degrees. These depends on the capability of adaptation that the universities have to a changing context and needs of the firms. The most relevant are now leading processes, such as University of Concepción, Los Lagos and Austral (Interview Official 1, 2014).

Nevertheless, other important condition for collaboration is the presence of intermediary actors between the Regional Government and the SMEs. The intermediation is necessary to interact with the firms' needs in the absence of a formal structure in the Regional Government. In this case, an enforced ARDs', provided of a skilled and dedicated team, and previous experience, is demonstrated to improve the relations between the public with the private sector. So, this allows an advanced performance on the strategy building than the other regions (Interview Official 1 and Advisor 2, 2014). An example of this is Region of Biobío that by means of the ARDs' aligned the private and research sector for the implementation of the projects. On the contrary Arica and Parinacota, that had a low level of critical mass presented difficulties on the building and implementing process of the strategy.

5. DISCUSSION.

The case study shows that the creation of certain governance structures and styles influence the performance of the regional innovation policies. The adoption of RSI policies are based on the idea that they can support this processes through appropriate incentives for cooperation and providing the necessary skills. The slow adoption of the systemic approach at a regional level derived in a discussion on the effective governance to coordinate the actors. The discussion underlies the conflict emerged through decentralisation and centralism, tension that is based on retaining and loss of power of the actors and the reconfiguration of traditional relations among them. According to this, it was argued that an effective governance can shape institutional structures in the long-term through changing the actors' disposition towards collaboration and learning. In this way, the Multilevel Governance (MLG), defined as an effective type of governance, can provide a stronger support than the centralised or a bottom-up model, in order to develop lasting regional innovation policies. A MLG permits the institutionalisation of coordination patterns that generate basic synergies among the actors, transference of relevant knowledge and an improved use of resources allocated in different levels. Other important assumption is that MLG permits the government to apprehend the territorial disparities and diversity required to take advantage of the regional opportunities for innovation and growth. In this perspective, the policy maker needs to interact and coordinate a multiplicity of actors and interests, in a complex way.

In this context, the study analyses the trajectory of the Chilean regional innovation policies, where each one in turn describes different configurations of relations and governance architectures in their implementation. In this perspective, the development of the policies produces certain outcomes and limitations that stresses the systems 'progress. Therefore, the

interaction of both elements, outcomes and limitations, produces an accumulation of learning experience and capacities relevant to evolve to the next period.

So, in this context the discussion is centred on the evolution to a MLG structure. The findings shows that in order to setup a MLG style of coordination the system needs to align some elements as precondition. Among these, the Regional Government needs to be the leader of the process, and in order to drive a regional innovation policy the authority require certain degree of competences and capacities. The concept of competences is related to the decentralisation of power and functions from the central government that provides autonomy on the decision making in the region. Whereas the capacity is linked to the regional receptivity or the capability to develop innovation policies and adapt to changing contexts (Cooke, 2002).

In the case of Chile, the implementation of regional innovation policies has evolved from a centralised or regionalised to a decentralised one, and finally, to the emergence of some elements of MLG form for policy making. The decentralisation trajectory follows the path of the European and most OECD countries, so we observe a process that is intertwined with programmes of international cooperation by which these models of development are transferred. The discussion arisen on the adoption of foreign models drives the attention to the tensions produced during their implementation. According to this, it is observed three periods that moves from a centralised country to a slow decentralisation.

The period of **regionalisation** was characterised by the implementation of the National Strategy of Innovation, with a top-down perspective and characterised by a monocentric governance structure. The government created the National Commission for Innovation and Competitiveness as a superstructure for innovation and the introduction of the regional dimension, as a factor of policy intervention. In this way, incentives and programmes to strengthen the sectors prioritised on the strategy were delivered from the national agencies directly to the regional firms and universities, as beneficiaries. The main programmes implemented were the Regional Development Agencies through CORFO, the Regional Research Centres by CONICYT and the prioritisation of agricultural agendas, by the Ministry of Agriculture.

During this period there is a process of devolution of some competences from the Central Government to the Regional Government. The regional fund for innovation was created and transferred for the regional administration but, the general framework limited the autonomy of the regional decisions. In order to implement innovation programmes the regional authority had to adjust their requirements to the existing standardised instruments. So, the transference of these competences permitted the reinforcement of the regional receptivity.

In this terms, the regional receptivity was strengthened through the development on administrative skills focused on the operation of the fund FIC-R. Firstly, there was a development on administrative functions focused to expend effectively the resources of the fund and an attempt to adapt national instruments to the regional context, by means of the FIC-R Roundtable. Secondly, the strategic programmes from CORFO and FIA generated a certain institutional experience on strategic planning and the establishment of systematic methods to interact with the territorial firms. Finally, it is observed a slight movement from the linear model to a systemic approach, mainly focused on the contextual analysis made and interaction of the agencies with the firms and universities to orient their instruments to the private sector's demand.

The limitations of this model are expressed on the difficulties to reduce the fragmentation. The direct relations formed between the agencies and the firms were unable to enhance a dynamic collaboration at a sub-national level, and figures assessed by the National Innovation Survey (2009-2012) shows that remain low through the period. On the other hand, the competences are referred to the decision making and implementation of policies, with no direct power to decide the innovation budgets and over the provision of skilled and multidisciplinary staff.

The process of **decentralisation** was motivated by regional mobilisation that demanded the transference of more autonomy and resources. Basically, the mobilisation was generated by the limitations of the monocentric model that was unable to respond to the territorial needs. This is observed in the concentration of resources in Santiago that provoked a high level of inequality with the regions that nurtured the regionalist discourse (OECD, 2009). So, the regional actors requested for dialogue spaces, transference of competences to decide and a better distribution of the national incomes (UFRO, 2009).

In terms of the outcomes of the decentralisation, the findings shows that during this period the central government incremented the flexibility on the use of the fund FIC-R. This flexibility produced openness to other actors, such as Universities and Research Centres that permitted the development of negotiation and managerial capacities in order to design regional instruments. So, there is an increment of collaboration between the regional bodies with the academic sector.

The restrictions of this process are observed on the outcomes of the modification of the FIC-R framework. The application of this flexibility biased the coordination patterns to the universities side, for the reason that the Regional Government had no competences to interact in a direct way with the firms. So, the findings shows that the modification had a negative impact on the collaboration and headed to a relation of competition among the agencies and the universities to capture more resources from the fund. In the practice the fund FIC-R was taken for organisational interests over the promotion of innovative activities.

So, the governance described is motivated by particular interests and a lack of capacities of leadership and competences of the Regional Government to drive this process. In this case, the Regional Government lacked of basic capacities to evaluate and negotiate regional instruments and interventions with CORFO that was related to the firms.

The case analysed, Proyecto Red, presents elements of a monocentric and bottom-up logics. The design and implementation of the programme was carried out by the central government, specifically SUBDERE, who transferred the European model to the regions. In this way, SUBDERE actively promoted the creation of the regional innovation strategy, supporting every stage. In order to implement the programme SUBDERE settled the coordination patterns between the National Agencies and the Regional Governments and spaces for discussion. Furthermore, distributed the roles for the intervention, by means of governance structures, such as the national and regional board and the working groups. On a bottom-up perspective, the Regional Government had autonomy and competences to drive a strategic process. It took the leadership of the process in the territory, gathering the private, public and academic sector to prioritise long-term objectives. Also, headed the Regional Board and the working group to support the process, in a political and technical way.

Nevertheless, Proyecto Red achieved some elements of and effective multilevel coordination patterns and reconfigured some institutional arrangements. Through the elaboration of the strategy there was an emergence of elements of coordination, suitability and reflexivity described by Borrás (2005). The coordination and reflexivity, that organise in an effective way the relations and at the same time, deal with the collective expectations, are observed on the structures built to support the process which delivered an institutional framework for the development of the RIS. Therefore, the national and regional board provided of general norms and generated spaces of interaction and negotiation for the actors which did not previously exist. Furthermore, provided elements of legitimacy and accountability on the approval of the strategy. Then, the component of suitability is assumed by the technical support given by the regional studies and analysis on the innovation activities and barriers in the regions, and particularly of the firms.

There are specific competences and capacities that influenced on the creation of a multilevel governance. In this way, the Ministry of Economy made some adjustments on the use of the fund FIC-R and allowed the regions to hire skilled professionals for its management and administration. Proyecto Red created new capacities to support the strategic process. Thus, SUBDERE implemented a learning platform that played an important role in the transference of capacities to the professionals of the regional governments involved in the programme. The platform provided skills for strategic planning and basic knowledge about innovation activities in firms. Moreover, trained the professionals on analytical tools and the transference of best practices from one region to another.

Even though the programme achieved the aim of building innovation strategies in all the regions that participated, there are limitations observed for the further institutionalisation of a Multilevel Governance. Through the process it is observed the high importance of SUBDERE as an intermediary between the National Agencies and the Regional Governments to collaborate on the design and implementation of regional policies. One of the the main barrier for a MLG coordination is given by the lack of recognition of the leadership of the regional government. On the other side, the lack of collaborative interest of CORFO with other agencies and public bodies.

6. CONCLUSIONS

The dissertation has assessed the trajectory of the decentralisation process of the regional innovation policies in Chile and the configuration of types of governance through the different periods. In particular, the evolution of the policies implemented showed that the transference of competences of each model, regionalisation and decentralisation, produces outcomes and limitations. In this interactions the regions generate basic capacities by learning through the experience. Furthermore, the findings indicate that in order to setup an effective governance that conduct to collaboration the system needs to align competences and capacities as a precondition.

In this case, the programme Proyecto Red there was an effective contribution to the Regional Governments on the transference of knowledge and capacities, in specific terms, the enhancement of the Regional Receptivity. This was developed during the implementation of

the programme and the strategic planning. Moreover, a substantial input was made by means of the learning platform, using interregional networks to transfer experience from one region to another.

In terms of the contribution to build a Multilevel Governance, during the implementation of the programme there are elements observed in the coordination patterns. The organisation of the programme was based on different spaces of collaboration for the transference of relevant information and prioritisation. The structures created, the Regional Board and the Working Group, achieved the aims of coordinate complex and multidimensional problems on innovation.

In addition to the enforcement of the regional receptivity and the multilevel coordination, other relevant element is the transference of competences from the central government to the regions. The most relevant was the creation of the fund FIC-R and the further transference of autonomy and flexibility to manage.

Accordingly, this three components led to the strengthening of the Regional Government as a relevant actor and leader to conduct innovation policies in their territories. This was demonstrated on the approval of the Regional innovation Strategies and the implementation of the programmes and projects planned.

Finally, the study suggests that there are elements of a multilevel type of organisation but a governance architecture is not established thus far. This is noticed in the tensions that persists between the national agencies, specifically CORFO, and the Regional Governments and an over dependency with SUBDERE as an intermediary with the ministries. The multilevel relations still needs time and a general framework that support interactions in vertical and horizontal ways.

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⁹ All the Reports were asked directly to the Undersecretary of Regional Development.

APENDIX 1: INTERVIEWS

The interviews used for qualitative analysis.

- 3 interviews for the National Level: SUBDERE and CONICYT.
- 2 interviews for the Regional Level: Regional Government and the Regional Office of CORFO.

Table 4: Interviews conducted

Official 1	Undersecretary of Regional Development (SUBDERE)	1 Public Official	National Level
Advisor 1	Undersecretary of Regional Development (SUBDERE)	1 Advisor	National Level
Advisor 2	National Commission for Scientific and Technological Research (CONICYT)	1 Advisor	National Level
Official 2	Chilean Economic Development Agency (CORFO)	1 Public Official	Regional Level
Official 3	Regional Government of O'Higgins	1 Public Official	Regional Level

APPENDIX 2: LIST OF ACRONYMS AND ABBREVIATIONS

AGCI	Chilean International Cooperation Agency
CONICYT	National Commission for Scientific and Technological Research
CORFO	Chilean Economic Development Agency
CORE	Regional Council
DIPRES	National Budgetary Secretary
FIA	Agrarian Innovation Fund
FIC	Fund for Innovation and Competitiveness
FIC-R	Regional Fund for Innovation and Competitiveness
GORE	Regional Government
GTZ	German International Cooperation Agency
INE	National Statistics Institute
INIA	National Institute of Agricultural Research
JICA	Japanese International Cooperation Agency
IDB	Inter-American Development Bank
MINECON	Ministry of Economy
ODEPA	Office of Agricultural Policies and Studies
OECD	Organisation for Economic Cooperation and Development
PMC	Program for improved competitiveness
PROCHILE	Chilean Export Development Agency
R&D	Research and Development
RSI	Regional System of Innovation
RIS	Regional Innovation Strategy
S&T	Science and Technology
SUBDERE	Undersecretary of Regional Development
RDA	Regional Development Agency

EU	European Union
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APPENDIX 3: TABLES

Table 1: Regional Research Centres

REGION	REGIONAL CENTRES	UNIVERSITIES
Arica y Parinacota	Centre for the Scientific and Technological development of men in the Desert, CODECITE	Tarapacá University
Tarapacá	Centre for Advance Research on Hydric resources, CIAREHSA	University of Arturo Prat
Antofagasta	Centre for Mining Research, CICITEM	University of Antofagasta, University Católica del Norte
Atacama	Centre for Regional Investigations and Sustainable development of Atacama, CRIDESAT	University of Atacama
Coquimbo	Centre of Advance Studies for Arid Zones, CEAZA	University of La Serena, Institute of Agriculture and Livestock Research and University Católica del Norte
Valparaíso	Research Centre for Healthy Food, CREAS	University Católica Valparaíso, Technical University Federico Santa María, Institute of Agriculture and Livestock Research and University Valparaíso
O'Higgins	Centre of Advance Studies in Fruticulture, CEAF	Institute of Agriculture and Livestock Research, University of Chile and Technological Metropolitan University
Maule	Centre for processed food studies, CEAP	Institute of Agriculture and Livestock Research, University of Talca and University Católica del Maule
Biobío	Centre for Advanced Research on Polymers, CIPA	University of Concepción and University of Bío Bío
Araucanía	Centre for Nutritional Genomics, CGNA	University of La Frontera, Institute of Agriculture and Livestock Research and University Católica de Temuco
Los Ríos	Centre of engineering for innovation, CIN	University Austral
Los Lagos	Centre for Research in Nutrition, Technology in Food and Sustainability, CIEN Austral	University Austral and University Santiago

Aysén	Research Centre of Patagonia's Ecosystem, CIEP	University of Concepción, University Austral and Institute of Agriculture and Livestock Research
Magallanes	Foundation Study Centre for Patagonia and Antarctic, CEQUA	University of Magallanes, Institute Chilean Antarctic and e Institute for the promotion of the fishing activities

Source: www.conicyt.cl

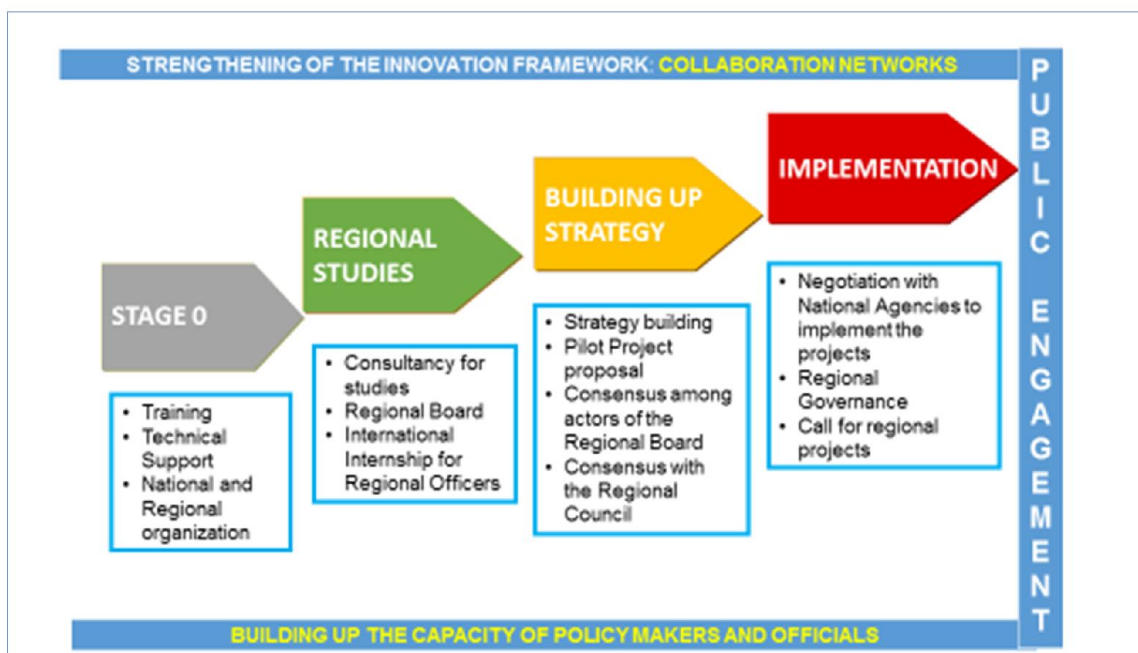
Table 2: Regional Stakeholders

NAME	DEPENDENCY	ROLE	REGIONAL PRESENCE AND ROLE
<i>REGIONAL GOVERNMENT</i>	Conformed by an Intendant that represents the President in the region, and a popular elected council.	Leadership on the prioritization of regional policies. It is a body of political agreement.	
<i>ADMINISTRATIVE DEPARTMENTS OF THE REGIONAL GOVERNMENT</i>	Regional Government	Conformed by 3 units that manage the regional funds and its allocation.	
<i>INNOVA CORFO</i>	Ministry of Economy	Supports innovation by means of direct incentives to the firms from studies to seed capital fund.	Establishes a direct relation with the firms and has offices in all the regions in Chile.
<i>FOUNDATION FOR AGRARIAN INNOVATION, FIA</i>	Ministry of Agriculture	FIA is the development Agency of the Ministry of Agriculture. Supports innovation by means of different programmes.	In 2009 Agrarian Agendas were established for the regions.
<i>NATIONAL INSTITUTE FOR AGRICULTURE AND LIVESTOCK, INIA</i>	Ministry of Agriculture	INIA is based on a private/public partnership oriented to investigation and	Has 10 regional centres in Coquimbo, Valparaíso, Metropolitana, O'Higgins, Maule, Bío Bío, de La Araucanía, de Los Lagos, Aysén and Magallanes.

		technology transfer.	
<i>CONICYT</i>	Ministry of Education	The Agency is responsible for building advanced human capital and support scientific and technological research.	Launched the programme for Regional Centres and implement regional projects in collaboration with the Regional Government.
<i>UNIVERSITIES</i>	Public and Private	Educational and research role	There is a mix of Regional and National universities. The only regions that do not have a regional university is O'Higgins and Aysén. Nevertheless, there are some careers from national universities.
<i>FIRMS ASSOCIATIONS</i>	Private	Represents firm's interests and requirements for innovation	There are national and regional associations. The regional presence depends on the productive sectors in the territories and the association capacity of the firms.

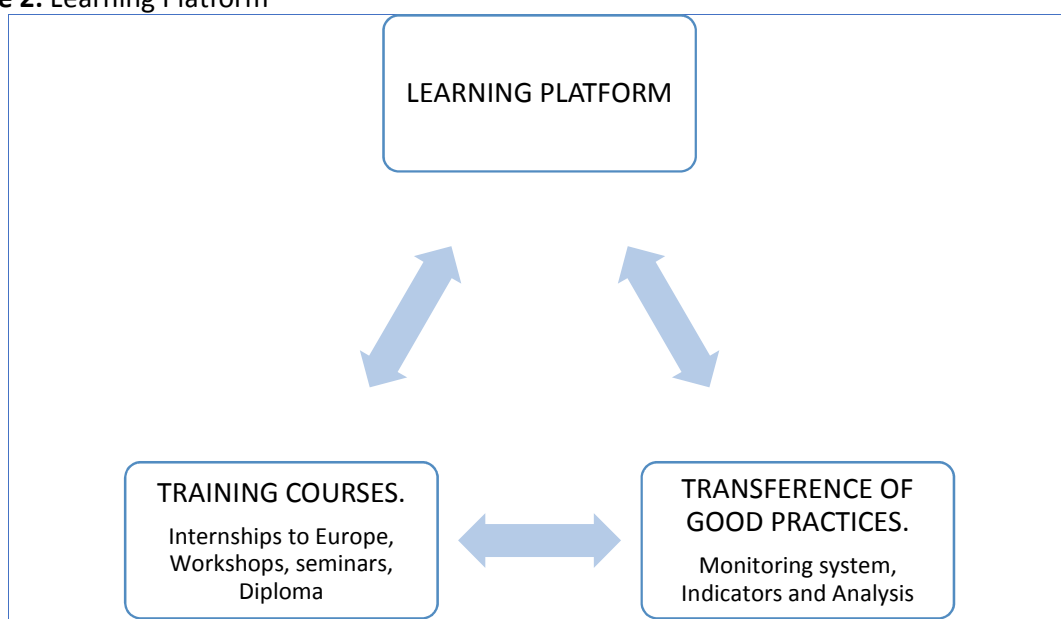
APPENDIX 3: FIGURES

Figure 1: Stages of Proyecto Red.



Source: Adapted from www.proyected.cl

Figure 2: Learning Platform



Source: SUBDERE, 2012

APPENDIX 4: LEARNING PLATFORM ACTIVITIES

The most relevant activities were:

- **Seminar “Introducing RIS”** focused on the transference of European Bests Practices on RIS, RIS+ and RITTS (January, 2011).
- **Workshop on “Regional Innovation Systems”**, a three day course based the RSI approach and the application to regional policies (April, 2011).
- Seminar on **Regional Innovation and Governance Models for Regional Innovation Agencies** (September, 2011), where the Business Development Basque Agency (SPRI)¹⁰ presented their management model and the RSI in Basque country.
- Workshop for journalists, **How to disseminate innovation**, (November 2012).
- **Diploma on Innovation and Territory** given by INGENIO-CSIC¹¹, 2012-2013.
- Other components of the training platform was the project in collaboration with the National Institute for Intellectual Property (INAPI) for the use of **Technology Watch for innovation projects**, based on interregional learning activities such as Seminars and workshops on software and specific tools, property rights and regional intelligence. The case of Madrid¹² was analysed as a best practice for a further implementation in Chile.

¹⁰ The purpose of SPRI, is to support and promote the economic growth of Basque companies, through the assistance and services it provides, in order to create wealth and wellbeing in the Basque Country, Euskadi. <http://www.spri.eus/en>

¹¹ INGENIO [CSIC-UPV] is a joint research institute of the Spanish National Council of Scientific Research (CSIC) and the Polytechnic University of Valencia (UPV). <http://www.ingenio.upv.es/en>

¹² Spanish organization for Technology Transfer and Knowledge Management <http://www.madrimasd.org/>